OPERATION AND MAINTENANCE INSTRUCTIONS

SVE and SPARGING SYSTEMS

FOR

KELCHNER ENVIRONMENTAL

EG & G MOUND
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2 INTRODUCTION

THIS MANUAL COVERS A GENERAL DESCRIPTION OF OPERATION PROCEDURES FOR A SOIL VAPOR EXTRACTION/SPARGING SYSTEM.

DETAILED INSTRUCTIONS FOR OPERATING AND MAINTAINING THE EQUIPMENT AND INSTRUMENTS ARE CONTAINED IN THE RESPECTIVE MANUFACTRER'S LITERATURE.

3 DESCRIPTION OF FACILITIES

3.1) GENERAL DESCRIPTION

THE EQUIPEMENT PROVIDED, FOR THE SVE/SPARGING SYSTEM CONSISTS OF:(2) SVE INFLUENTS WELLS, (2) 5" DIA. LEVER OPERATED BUTTERFLY VALVES, (2) 5" DIA. MOTORIZED BUTTERFLY VALVES, (1) 80 GALLON LIQUID KNOCKOUT TANK, (1) MANUAL DIAPHRAGM PUMP, (1) LEVEL SWITCH(S) CONTROLLED CONDENSATE PUMP, (1) INLINE AIR FILTER, (2) 2000 LB VAPOR PHASE CARBON VESSELS, (1) 6L SUTORBILT BLOWER, (1) 5L SUTORBILT BLOWER, (1) 50 HP EXPLOSION PROOF MOTOR, (1) DISCHARGE SILENCER FOR EACH OF THE TWO BLOWERS AND (1) HEAT EXCHANGER. THE SPARGE COMPONENTS CONSIST OF: (1) INLET SILENCER, (1) 5H SUTORBILT BLOWER, (1) 25 HP EXPLOSION PROOF MOTOR, (1) DISCHARGE SILENCER, (2) 3" DIA. MOTORIZED BUTTERFLY VALVES, (2) 3" DIA. LEVER OPERATED BUTTERFLY VALVES AND (2) 3" DIA. INLINE CHECK VALVES.

3.2) PROCESS DESCRIPTION

THIS PROCESS DESCRIPTION IS A GENERAL DESCRIPTION OF THE OPERATION OF THE SVE/SPARGE SYSTEM.

VAPORS ARE EXTRACTED FROM THE GROUND THROUGH THE (2) 5" DIA. LEVER OPERATED BUTTERFLY VALVE, (2) 5" DIA. MOTORIZED BUTTERFLY VALVES, INTO THE LIQUID/VAPOR SEPARATOR OUT OF THE SEPERATOR INTO THE INLINE FILTER. FROM THE INLINE FILTER THE VAPORS THEN PASS THROUGH THE (2) VAPOR PHASE CARBON VESSELS. FROM THE CARBON VESSELS THE VAPOR THEN ENTER THE 6L SUTORBILT BLOWER, THROUGH THE DISCHARGE SILENCER INTO THE HEAT EXCHANGE, FROM THE HEAT EXCHANGE INTO THE 5L SUTORBILT BLOWER, FROM THE BLOWER THROUGH IT'S DISCHARGE SILENCER BEFORE BEING DISCHARGED OUT-OF-DOORS. THERE IS A 4" DIA. LEVER OPERATED BUTTERFLY VALVE WITH A INLET SILENCER TO ALLOW AMBIENT AIR TO BE DRAWN INTO TO SYSTEM, LOCATED JUST PROIR TO THE LIQUID/VAPOR SEPARATOR.

THE AMBIENT AIR FOR THE SPARGE SYSTEM IS DRAWN IN THROUGH A INTAKE AIR FILTER, THE AIR THEN PASSES THROUGH A INLINE SILENCER, THEN THROUGH THE 5H SUTOBILT BLOWER, WHICH IS DRIVEN BY A 25 HP EXPLOSION PROOF MOTOR, THE AIR THEN PASSES THROUGH A DISCHARGE SILENCER, THE AIR THEN GOES THROUGH (2) 3" DIA. MOTORIZED BUTTERFLY VALVES, (2) LEVER OPERATED BUTTERFLY VALVES AND THEN (2) 3" DIA. CHECK VALVES BEFORE BEING DISCHARGED INTO THE GROUND.

3.3) OPERATING DESCRIPTION

THE DESIGN OPERATING CONDITIONS FOR THE EXTRACTION SYSTEM ARE AS FOLLOWS:
- INFLUENT AIR FLOW (CONTINUOUS) - 350 SCFM @ 18" Hg VACUUM
- INSTANTANEOUS RATE
- TEMPERATURE - BETWEEN 45 - 55 DEGREES F (DUE TO VARIATION IN GROUND TEMPERATURE)

THE DESIGN OPERATING CONDITIONS FOR THE SPARGING SYSTEM ARE AS FOLLOWS:
- INFLUENT AIR FLOW (CONTINUOUS) - 280 SCFM @ 13 PSI PRESSURE
- INSTANTANEOUS RATE
- TEMPERATURE - BETWEEN 45 - 90 DEGREES F (DUE TO VARIATION IN OUTDOOR AIR TEMPERATURE.)

3.3.1 UTILITY REQUIREMENTS

1. ELECTRICAL
   a) 50 HP EXPLOSION PROOF BLOWER MOTOR
   b) 25 HP EXPLOSION PROOF BLOWER MOTOR
   c) 3/4 HP EXPLOSION PROOF TRANSFER PUMP
   d) 1/2 HP EXPLOSION PROOF HEAT EXCHANGER MOTOR
   e) LIGHTS/CONTROLS

4 START-UP

4.1) PRELIMINARY STEPS

CHECK ALL EQUIPMENT CONNECTIONS AND PIPING CONNECTIONS FOR LEAK TIGHTNESS. IF POSSIBLE PRESSURE TEST THE SYSTEM WITH COMPRESSED AIR AND SOAP TEST ALL CONNECTIONS.

AFTER THE FOREGOING CHECK HAS BEEN MADE AND ALL POINTS ARE SATISFACTORY, ALL TEMORARY PLUGS/BLIND FLANGES SHALL BE REMOVED.

4.2) PLACING SYSTEM IN OPERATION

- 4.2.1 SVE AND SPARGE SYSTEM START-UP

ON THE CONTROL PANEL FACE, ALL THE HAND/OFF/AUTO SWITCHES SHOULD BE IN THE OFF" POSITION. (ALSO THE TREATMENT SYSTEM IN BUILDING 300 MUST BE IN OPERATION FOR THIS AS/SPARGE SYSTEM TO START AND RUN IN THE AUTOMATIC MODE. IF THE TREATMENT SYSTEM IN BUILDING 300 SHUTS DOWN, THIS AS/SPARGE SYSTEM WILL SHUTDOWN.

STEP 1 - PRESS THE RESET BUTTON, THIS WILL CLEAR ANY ALARM CONDITIONS THAT MAY HAVE ACCURED DURING PRE-START-UP TESTING.

STEP 2 - PUT THE SELECTOR SWITCH(S) FOR THE VE BLOWER, THE SPARGE BLOWER THE TRANSFER PUMP AND THE HEAT EXCHANGER INTO THE AUTO POSITION. THE SYSTEM WILL START RUNNING AND BE UNDER AUTOMATIC CONTROLS.

AUTOMATIC SHUTDOWNS THAT WILL CONTROL THE SYSTEM ARE (1) SEPARATOR HIGH HIGH LEVEL - TOTAL SYSTEM SHUTDOWN, AND (2) VE BLOWER OVERLOADS, WHICH WILL SHUTDOWN THE VE AND SPARGE BLOWERS.

4.3 START-UP AFTER A SHUTDOWN

THERE ARE TWO SHUTDOWNS IN THE SYSTEM: HIGH HIGH LEVEL IN THE LIQUID/VAPOR SEPARATOR, WHICH IS A TOTAL SYSTEM SHUTDOWN. AND A VE BLOWER OVERLOADS, WHICH WILL SHUTDOWN THE VE BLOWER AND THEN THE SPARGE BLOWER.

ONCE A SHUTDOWN HAS OCCURED -

A - CORRECT THE CONDITION THAT CAUSED THE SHUTDOWN, (A SHUTDOWN CONDITION WOULD BE INDICATED BY THE RED LIGHT ON THE CONTROL PANEL FACE BEING ON).

4.3 START-UP AFTER A SHUTDOWN CONTINUED,

B - FOLLOW STEPS 1 - 2 ABOVE TO GET THE SYSTEM UP AND RUNNING IN THE AUTOMATIC MODE.

LOSS OF POWER TO THE SITE -

IF YOU LOSE POWER TO THE SITE, SOMEONE WILL HAVE TO GO TO THE SITE AND PHYISCALLY RESTART THE SYSTEM.

TO RESTART THE SYSTEM AFTER A LOSE OF POWER, YOU WOULD FOLLOW STEPS 1 - 2 OF SECTION 10.1) SEQUENCE OF OPERATION - STARTING UP THE SYSTEM.

5 TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
SVE & SPARGE BLOWERS NOT RUNNING	HIGH, HIGH LEVEL IN KNOCKOUT TANK	CHECK TO SEE IF TRANSFER PUMP IS WORKING - POWER TO PUMP
	BLOWN SVE MOTOR OVERLOADS	HAVE MOTOR CHECKED BY AN ELECTRICAN
	BLOWN SVE BREAKER IN SERVICE PANEL	REPLACE BLOWN BREAKER
	LOSS OF POWER TO SYSTEM	CONTACT ELECTRICAL COMPANY
SPARGE BLOWER NOT RUNNING	BLOWN SPARGE MOTOR OVERLOADS	HAVE MOTOR CHECKED BY AN ELECTRICAN
	BLOWN SPARGE BREAKER IN SERVICE PANEL	REPLACE BLOWN BREAKER
SVE SYSTEM SHOWING HIGH VACUUM	PLUGGED INFLUENT LINES	LOCATE AND REMOVE LINE OBSTRUCTION
	CARBON BED(S) PLUGGING UP	CARBON CHANGE-OUT
TRANSFER PUMP NOT PUMPING	NO POWER TO PUMP	CHECK FOR BLOWN BREAKER IN SERVIC PANEL
HEAT EXCHANGER NOT WORKING	NO POWER TO FAN MOTOR	CHECK FOR BLOWN BREAKER IN SERVICE PANEL

6 GENERAL SYSTEM INFORMATION

6.1) SHUTDOWNS

FOR SHUTDOWNS; THE BLOWERS NEED TO BE SHUT OFF.

6.1.1) SHORT TERM SHUTDOWNS

FOR A SHORT TERM SHUTDOWN, PUT THE BLOWER SELECTOR SWITCH IN THE OFF POSITION TO STOP THE PROCESS FLOW. ONCE THE SYSTEM IS SHUTDOWN AND THE WORK THAT REQUIRED THE SHUTDOWN HAS BEEN PERFORMED. TO TO RESTART THE SYSTEM, PUT THE BLOWER SELECTOR SWITCH(S) IN THE AUTO POSITION, THE SYSTEM WILL BE IN THE AUTO MODE AND THE SYSTEM WILL BE BACK UP AND RUNNING.

6.2) EMERGENCY PROCEDURES

IN THE EVENT THAT SOMETHING SHOULD OCCUR TO CAUSE A SHUTDOWN. THE OPERATION SHALL BE STOPPED UNTIL THE SITUATION HAS BEEN IDENTIFIED AND REPAIRED.

LOCK OUT/TAG OUT PROCEDURES ARE RECOMMENDED WHENEVER ANY WORK IS TO BE PERFORMED ON ANY PIECE OF EQUIPMENT, (WHETHER IT IS ELECTRICAL OR NONELECTRICAL). IF SOME SERVICE WORK IS REQUIRED, MAKE SURE YOU HAVE A QUALIFIED PERSONNEL DOING THE SERVICE WORK.

7 SYSTEM MAINTENANCE

SEE MANUFACTURER'S LITERATURE FOR INDIVIDUAL ITEM MAINTENANCE.

BLOWERS SHOULD HAVE THEIR OIL CHANGED AND GREASE ADDED EVERY 1000 HOURS. (APPROXIMATELY ONCE A MONTH). (IF YOU ARE USING THE MANUFACTURER,S RECOMMENDED LUBRICANTS, THE OIL CHANGES CAN OCCUR ONCE EVERY 7000 HOURS).

GREASE BLOWERS EVERY 2 WEEKS OR 500 HOURS.

THE FILTER ELEMENTS IN THE TWO PREFILTERS SHOULD BE CHANGED WHEN THERE IS A 10-15 PSI OR 1.0-1.5 " OF Hg DIFFERENCE BETWEEN THE GAUGES ON EITHER SIDE OF THE FILTER HOUSING.

IF YOU SEE A VACUUM DIFFERENCE OF 1.0-1.5" OF Hg BETWEEN THE INTAKE MANIFOLD AND THE EFFLUENT OF THE LIQUID/VAPOR SEPARATOR, YOU WOULD WANT TO INSPECT AND CLEAN IF NECESSARY THE STAINLESS STEEL MESH IN THE EFFLUENT OF THE SEPARATOR.

7.1) SHUTDOWNS

SEE "SHUTDOWNS" SECTION 6.1 OF GENERAL SYSTEM INFORMATION